import java.util.Arrays;

public class SubsetSum {

public static boolean isSubsetSumMemo(int[] arr, int n, int target, int[][] dp) {

if (target == 0) {

return true;

}

if (n == 0) {

return false;

}

if (dp[n][target] != -1) {

return dp[n][target] == 1;

}

if (arr[n - 1] > target) {

dp[n][target] = isSubsetSumMemo(arr, n - 1, target, dp) ? 1 : 0;

} else {

boolean include = isSubsetSumMemo(arr, n - 1, target - arr[n - 1], dp);

boolean exclude = isSubsetSumMemo(arr, n - 1, target, dp);

dp[n][target] = (include || exclude) ? 1 : 0;

}

return dp[n][target] == 1;

}

public static void main(String[] args) {

int[] arr = {3, 34, 4, 12, 5, 2};

int target = 9;

int n = arr.length;

int[][] dp = new int[n + 1][target + 1];

for (int[] row : dp) {

Arrays.fill(row, -1);

}

boolean result = isSubsetSumMemo(arr, n, target, dp);

System.out.println("Subset with given sum exists (memo): " + result);

}

}